WEBVTT Kind: captions Language: en

00:00:05.967 --> 00:00:09.200 - The emergence of bacterial resistance is incredible.

00:00:10.433 --> 00:00:12.832 Bacteria are evolving to protect themselves

00:00:12.833 --> 00:00:15.533 or figure out ways to get around the antibiotics that we have.

00:00:21.133 --> 00:00:24.367 - Bacteriophages or phages are the viruses of bacteria.

00:00:25.100 --> 00:00:27.599 Some viruses can infect us and make us sick,

00:00:27.600 --> 00:00:29.399 but these ones are very specific

00:00:29.400 --> 00:00:31.133 and can only infect bacteria.

00:00:35.900 --> 00:00:37.466 The estimates are that there's

00:00:37.467 --> 00:00:40.166 10 to the 31st bacteriophages on the planet Earth.

00:00:40.167 --> 00:00:42.366 That's like 10 million times more than there are stars,

00:00:42.367 --> 00:00:43.567 so they're everywhere.

00:00:44.467 --> 00:00:47.666 - Especially in my clinical population with cystic fibrosis,

00:00:47.667 --> 00:00:53.400 we are really challenged with a limitation of antibiotics that are available to us.

00:00:54.267 --> 00:00:59.432 The common bacteria we see in the lungs are Pseudomonas and Staphylococcus Aureus

00:00:59.433 --> 00:01:01.832 and that's where colleagues at Yale came to me

00:01:01.833 --> 00:01:06.399 with this idea that there's a phage that could potentially

00:01:06.400 --> 00:01:08.066 target and kill Pseudomonas

00:01:08.067 --> 00:01:10.333 and potentially target and kill Staph.

00:01:11.367 --> 00:01:13.966 - Their killing mechanism is totally different than chemical antibiotics

00:01:13.967 --> 00:01:15.799 and so the way we're working with them,

00:01:15.800 --> 00:01:17.300 they work together with antibiotics.

00:01:18.033 --> 00:01:20.866 If you have something that's resistant to penicillin or something,

00:01:20.867 --> 00:01:24.133 it's very unlikely that it's also gonna be resistant to a particular phage.

00:01:25.800 --> 00:01:28.432 - In the laboratory, Dr. Chan is able to

00:01:28.433 --> 00:01:31.366 take a look at a library of phages

00:01:31.367 --> 00:01:34.432 and find a phage that's gonna target and kill that Pseudomonas

00:01:34.433 --> 00:01:37.432 and therefore, the risk is minimized because

00:01:37.433 --> 00:01:40.567 only that particular Pseudomonas will be targeted.

00:01:41.400 --> 00:01:43.166 - It's very personalized and it's very precise

00:01:43.167 --> 00:01:45.499 and you're just going in and removing a very

00:01:45.500 --> 00:01:48.632 specific strain of bacteria from the individual.

00:01:48.633 --> 00:01:53.299 - [Dr. Koff] And it becomes a really important example of personalized medicine,

00:01:53.300 --> 00:01:56.099 which is can we be very selective and specific

00:01:56.100 --> 00:01:57.667 to what's going on for each individual.

00:02:08.267 --> 00:02:10.266 It's encouraging because

00:02:10.267 --> 00:02:13.232 we've seen that the amount of Pseudomonas has decreased

00:02:13.233 --> 00:02:17.799 in the sputum of each of the individuals that we have treated

00:02:17.800 --> 00:02:23.133 and there's evidence that the Pseudomonas has become more sensitive to traditional antibiotics.

00:02:24.067 --> 00:02:26.332 - It's definitely the dream, right?

00:02:26.333 --> 00:02:28.699 To go from just a random discovery

00:02:28.700 --> 00:02:30.232 and doing the basic research,

00:02:30.233 --> 00:02:31.199 characterizing it

00:02:31.200 --> 00:02:32.932 and then bringing it all the way to the person.

00:02:32.933 --> 00:02:33.867 It's fantastic.

00:02:35.700 --> 00:02:38.332 - [Dr. Koff] It's a great example of someone in the laboratory

00:02:38.333 --> 00:02:40.866 working with someone in the clinic

00:02:40.867 --> 00:02:43.666 to take a good idea and develop it

00:02:43.667 --> 00:02:46.566 and as we all want to do as physicians, right?

00:02:46.567 --> 00:02:48.399 We got into this to help people

00:02:48.400 --> 00:02:51.632 and here in front of us is an opportunity.

00:02:51.633 --> 00:02:54.632 Obviously I'm a lung doctor, we're not limited to that.

00:02:54.633 --> 00:02:56.466 If we can develop this technique

00:02:56.467 --> 00:02:57.999 and understand how to utilize it,

00:02:58.000 --> 00:03:00.366 it then becomes available to other places

00:03:00.367 --> 00:03:03.233 where we have these multi-drug-resistant pathogens.